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Editorial Comment . . .

National Productivity Council

LAST DECEMBER, a National Productivity Council was established by act of Parliament. The Prime Minister has now announced the members of the Council and the selection made represents a group of outstanding leaders in the fields of business, labor and government.

The objects of the Council, as set forth in the act, are in part, "To promote and expedite continuing improvement in productive efficiency in various aspects of Canadian economic activities—". The act then spells out specific areas through which these goals might be achieved. When introducing the bill to establish the National Productivity Council, the Minister of Trade and Commerce laid much stress on the importance of improving productivity from the standpoint of strengthening Canada's position in international trade.

This action of the government has been favorably received throughout the country. For in this measure, Canada is but following in the footsteps of 29 other countries. The lead in this movement was provided in the U-K by the formation of the Anglo-American Council on Productivity in 1948. There is clear evidence that the work of these Councils has made a significant contribution to improved productivity and to the competitive position of their respective countries in the world market.

While the Productivity Council in each country is organized according to the needs of each, they all follow the basic approach set by the British Productivity Council. That approach is to ascertain the best methods followed in other countries, adding to them the techniques developed by its own research, and disseminating this combined knowledge through seminars, bulletins, journals, etc. For example, the British Productivity Council issues a monthly bulletin called *Target*. Its purpose is to stimulate an attitude of mind towards improving productivity and it contains specific ideas applicable to different industries. This bulletin is supplemented by special publications dealing with specific problems such as work studies, standardization, quality control and cost reduction and cost control. In carrying out the work of the Council, teams have been organized and sent abroad to learn at first hand what is being done in other countries to improve productivity. One of the most

dynamic productivity councils is in India where a staff of 155 organizes courses, seminars and conferences on all aspects relating to productivity. A monthly journal is issued and productivity teams are sent to various countries in the world to bring back ideas that will be of value.

In so far as the Canadian situation is concerned, we suggest that the problem is more than just one of increasing productivity. Canada already stands high among the nations of the world in productivity. Nevertheless, Canada's ability to compete in world markets is constantly being threatened by increasing costs of production. The reason for this is that the fruits of improved productivity have been manifested in higher wages, higher dividends and higher taxes rather than in lower prices. The only way in which Canada can improve its position in world markets is to apply the benefits of increased productivity to lower prices. This will call for statesmanship of the highest order on the part of management, labor and government.

"EVOLUTION OF THE MANAGER" by Dr. Jay F. W. Pearson

Proceedings of Seminar on Executive Practices and Methods, 1959

Published H. B. Maynard & Co., November, 1959

If we go back to Roman times, we are reminded that civilian money-lenders followed Roman armies into newly conquered territory, and turned an honest or dishonest profit as the occasion permitted. Perhaps our businessman loaned money to conquered peoples at exorbitant rates so they could pay the newly levied taxes. The dishonest profit was often more prevalent than the honest one. We are told that these ancient small businessmen, who might lease galleys for the transport of supplies to Roman armies (let us say in Spain, fighting Carthage's Hannibal), were guaranteed by the government against loss through enemy sinkings. Often, a worthless, rotten galley, rowed to sea with ballast only, and sunk by the owner, could pay off handsomely, if the deal was handled quietly and smoothly.

Such activities had their parallel in shoddy cloth and rotten mule harness, sold to Union and Confederate armies by conscienceless businessmen on both sides, during our War between the States.

Throughout history, the urge for gain has driven men all over the world to completely unethical practices. Periodically, rulers and people have turned on these exploiters and either liquidated them or regulated them, to the advantage of all concerned. Thus we can say that business ethics and principles, cyclically, have existed at a high or low level for many centuries.

In recent years, some countries have rated businessmen among the lowest of the strata of society. Even today, it is hard to maintain ethics in any human activity where there is the possibility of quick and adequate gain, within the law, or even near to the law.

How many alleged crooked politicians would we have if no men with improper profit-motives were there to bribe them? The "desire for profit", one of the driving forces that made civilization's progress possible (and contributed so much to the development of our own great democracy) is as difficult to control as are the fusing or fissioning of atoms. It is equally *helpful*, if controlled successfully, or equally *destructive*, if uncontrolled, or if unwisely restricted.

ADVANTAGES AND LIMITATIONS OF ELECTRONIC DATA PROCESSING*

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In this paper the author outlines many of the new developments in electronic data processing that make it more feasible than ever for the average company. The advantages of EDP systems are weighed and some of the tried-and-true lessons of past experience are adduced.

IN RECENT YEARS there has been a great deal of interest shown in electronic data processing and there have also been many claims for what it can do. Some people have said that electronic data processing will in the next decade replace office workers on a wholesale basis. A few even claim that computers will take over from executives many of their decision-making functions. It is important to recognize that electronics has already produced some significant changes in business data processing. Many routine accounting operations have been either drastically changed or entirely eliminated. There is no doubt that electronic data processing has done more to change administrative procedures than anything else. The interest in electronics is sound and some of the claims are based on fact. On the other hand, much of the publicity is sheer nonsense.

STORAGE SPACE ALMOST UNLIMITED WITH EDP

Basically there are five important characteristics or advantages of electronic data processing that set it quite apart from punched card or other machine operations. The first characteristic of EDP is the tremendous capacity for storing information in a form that is readily accessible to the computer. In most practical applications presently being solved on these machines it is necessary to have readily available in some mechanical or electronic form tremendous volumes of data. In a typical life insurance application being planned on a large-scale computer, about 500 characters of information for each policy holder will be stored electronically on magnetic tape (much like the tape you use on home recorders). With over one-half a million policy holders scheduled for conversion to this operation, this means a total storage requirement of over one-quarter of a billion characters. Even though information is very densely packed on magnetic tape at over 500 characters per linear inch, this will still require more than 25 reels of tape, each 2,400 feet long. By contrast, however, this same quantity of information storage would require over three million punched cards stored in more than one thousand filing drawers.

* A paper presented at a S.I.C.A. Seminar on Electronic Data Processing held at the Guild Inn, Scarborough, November 28th to 30th, 1960.

Dr. Gellman has been working with electronic computers since 1948 when he joined the staff of the University of Toronto's Computation Centre. He is a graduate of the University, holding a Ph.D. in Mathematics and Physics. In 1952 he became Head of the electronic computer group at Atomic Energy of Canada Limited and later was employed with Adalia Limited, a firm of consulting engineers. Since 1955 Dr. Gellman has been President of H. S. Gellman & Company Limited, a Canadian group of systems consultants specializing in the application of electronic computers to business, engineering and scientific activities. He is currently Vice President of the Computing and Data Processing Society of Canada and is a past director of the Systems and Procedures Association, Toronto Chapter.

But more important than the sheer magnitude of the information or data that can be fed into or out of a computer is the ability of the machine to use these data readily. Most computing machines can operate ten or more tape handling units. With about ten million characters of information stored on each reel of magnetic tape, this means that an electronic processor can presently handle at one time up to about one hundred million characters of data. And this information is readily available since the magnetic tapes can be typically read at the rate of 75 to 100 inches per second, or 40,000 to 60,000 characters per second. Compare this to a maximum card-reading speed of 1,000 cards per minute, or only slightly over 1,000 characters per second.

In addition to tape storage, most electronic computers also have an internal memory ranging in capacity from 20,000 to 100,000 characters of information. Data stored in the internal memory of a machine have the unique feature that every character stored is available for use almost instantaneously (in a matter of thousandths or millionths of a second. This type of storage is often called random or rapid access memory.

An interesting development in this area is IBM's Random Access Memory System. It will store several million characters, and has an average access time of one-half a second. This means that one can get any piece of information in this system in about one-half a second. Needless to say, there is no other non-electronic way to store such quantities of information where one can get any particular part of it in so short a space of time. RCA has recently announced a new electronic data processing system called the 301 System which uses removable magnetic discs with an average access time of about two seconds.

Another advantage of electronic storage is the ability to have a large quantity of information about a particular kind of transaction or item available close together. In a magnetic type system it is quite common to store anywhere from 500 to 1,000 alphabetic or numeric characters for each account or unit record in a file. Moreover, all this information is usually brought into the internal memory of the computer during the processing of a transaction. This means that all the information associated with an account can be scanned electronically during a posting operation, thus adding great flexibility to electronic data processing over punched card equipment. Consequently, magnetic tape is much better for file maintenance than punched cards.

This large capacity to perform many operations involving a great deal of data has enabled users to achieve a high degree of integration. For example, on punched card equipment, primarily because of the limitations in card and calculator capacities, operations are often broken down into several machine runs or procedures. For example, in one punched card application involving invoice billing there were four separate operations for: billing, inventory control, accounts receivable, and sales statistics. However, with a medium-sized electronic computer, the company can handle the entire operation in one run through the machine, and still utilize only half the capacity of the machine. A corollary benefit in this case is a vast improvement in the speed of report preparation. One particular sales statistics report is available in a few days' time as compared with the several weeks formerly required.

SELECTIVE ABILITY OF EDP

The second important feature of electronic computers is their unique ability to perform certain logical and decision-making functions. For example, these machines

are able to choose a particular course of action from a range of alternatives based upon some criterion. This fact alone adds tremendously to the capability of these machines over the older type of equipment. What this means is that it is possible to instruct electronic machines to do one thing if, say, there is sufficient inventory on hand, and then to take an entirely different course of action for the reverse situation.

In any practical application, such as payroll processing on a computer, there are literally thousands of such decision steps or operations required to provide for the myriad of possible alternative situations that arise in such a problem. As a matter of fact, this ability of a computer to make decisions has indirectly led some users into difficulty by enabling them to instruct or program their computer to handle many or all of the possible exceptions to a particular operation. Generally speaking, exceptions can be handled more economically manually or in some other way outside the machine. This is particularly true when the volume of exceptions is low.

INCREDIBLE SPEEDS POSSIBLE WITH EDP

A third feature of electronic computers is the extremely fast computing and processing speeds of most electronic systems. As a matter of fact, these machines can perform arithmetic operations so quickly that the users of electronic equipment use quite different measures of time than we are normally accustomed to. The times required to perform the various operations in a computer are generally measured in thousandths of a second for the slower machines and in millionths of a second for the faster machines.

As an example of the speed of these machines, two of the largest and most widely publicized computers in this country, the IBM type 705 machine and the Sperry Rand Univac II, will both perform an addition or subtraction of two ten-digit numbers in about 200 millionths of a second. This is equivalent to about 5,000 such operations in one second's time. Multiplication generally is a much slower operation on these machines since it is performed by the brute force method of successive additions.

Still the IBM 705 or the Univac II will multiply two ten-digit numbers in two thousandths of a second or about 500 such computations per second. Division is usually even a slower operation than multiplication, at a rate of only about 250, or less, divisions per second. Despite these low speeds for multiplication and division, that is, relative to addition and subtraction, these machines are still awfully fast by comparison with the speed of punched card equipment where the maximum speeds are in the order of only two to twenty operations per second, as compared to the 250 to 5,000 operations per second for the computer operations mentioned. Some of the new computer systems recently announced and classified as small-scale or medium-scale systems can perform additions, multiplications, divisions and logical decisions as quickly as the large-scale 705 or Univac II.

It is important to recognize that when we think of electronic computers and their operating speeds we are really focusing on the speed of data manipulation within the machine even though the number of actual arithmetic operations may be negligible.

ACCURACY IS ALMOST FOOLPROOF

The fourth, and possibly least often discussed feature of electronic processing, is its almost unbelievable accuracy as compared with alternative methods of computing. This is achieved primarily as a result of the great care which the computer manufacturers have taken in the design and construction of these machines. For example,

most computers include automatic checking operations which verify that data have been read correctly from the magnetic tapes and transferred within the machine without any loss of information. The arithmetic or computing operations are also usually checked in one way or another.

Electronic calculators actually operate many hours without making a mistake. When one realizes that just one hour of such operation on a large-scale computer is equivalent to several years on a desk calculator, their degree of accuracy is almost unbelievable. Thus, when dependability is measured in terms of the work done between errors, electronic processors are more accurate by several orders of magnitude than any human or mechanical system (two billion versus 200 for humans). And what is more important, when the machines do make a mistake they generally provide some indication of the error, either as a result of the built-in checking, or because of the instructions or program which the user puts into the machine.

In regard to the reliability of magnetic tape operations most computers incorporate checking operations, usually called parity checks, which in a sense are simply a means of keeping track, or totals of the magnetic spots recorded on the tape.

READING ABILITY SAVES WORK

A final point that should be made when discussing the features of electronic computers is their ability to store and follow automatically a lengthy program or set of instructions which describes a particular operation.

The electronic digital computer will do only what it is told to do by people who feed it a sequence of instructions. This sequence of instructions is called a program and without some program stored in its memory the computer cannot function.

Inside the computer data and instructions look alike and it is up to the programmer to tell the machine where to find its first instruction. From there the machine follows the prescribed sequence.

To operate a computer we would read into the main memory from cards or tape first the program instructions, then the data; send control to the first instruction and from here on the operation is completely automatic. The machine will compute, print, read new data and stop automatically under control of the program. In other words once a computer has been told what to do and is given the information to process, it will proceed automatically to perform all of the steps of the operation in their proper sequence. This ability results in the elimination of much clerical effort like card handling and the transferring of operations from one machine to another which is necessary in tabulating systems.

The five characteristics of electronic data processing which have just been discussed can be directly translated into savings of time and money.

SOME LIMITATIONS OF EDP

However, to avoid over-selling electronic data processing, we should discuss some of its limitations. First, computers are complicated and require considerable skill to instruct or program. These machines are not very intelligent and can do only what the human programmer tells them to do. Consequently, it is necessary to plan computer operation in great detail.

Programs must be designed to include system checks because clerks feeding information into an electronic system make errors. And if this happens these machines will make a wrong calculation just as rapidly as a correct one. For this

reason, poorly designed procedures, which permit inaccurate data to be processed can result in extremely costly machine delays.

Another limitation of electronic data processing is the high cost of the equipment. Although it is true that electronic computer systems are coming on the market today in smaller and less expensive versions than were available several years ago, economic feasibility of a computer installation must still be examined very carefully today.

Finally, the most important limitation of electronic data processing is the limitation which it shares with all other data processing tools and that is; a data processing tool cannot create a system. If the flow of information throughout a company is poorly designed, then the use of an electronic computer will not be effective.

WILL EDP BE FEASIBLE FOR ALL?

In view of these limitations of EDP, you may wonder whether electronic data processing has a place in your own organization. After all, considering the high cost of this equipment and the amount of human effort required to install such a system, isn't it feasible for only the largest organizations? Two or three years ago the answer would have been yes, but today hardly a month goes by without a new computer system being announced, and it seems as though each new system is faster, less expensive and smaller than its predecessors.

Today it is possible to rent a complete magnetic tape computer system for less than half the typical cost of three years ago. It is also possible to rent a very versatile punched card stored program computer system which can replace economically some of your punched card tabulators and calculators.

Considering all these advantages and limitations of EDP, it is only fair to say that today more and more companies are recognizing that electronic computer systems are worth having because they can save money. One of the pioneer users of EDP in the United States is so convinced of this fact that it is doing everything it can to add applications to its electronic computer systems as rapidly as possible. This company believes that each month's delay in converting to EDP is costing it money.

An EDP system is like an iceberg. The hardware—the part you see—is only a small fraction of what it takes to produce an effective system. The system design and programming are of prime importance. The electronic computer can be compared to the monkey wrench on the garage wall. What you do with it is the important thing.

Because an effective EDP system involves more than hardware alone, it is extremely difficult to convert directly from a manual data processing system to an electronic data processing system. I believe that the ideal approach is to convert from a manual system to a punched card system and then to an EDP system. The punched card system will teach people in the organization the new disciplines which are essential for a successful EDP system. The electronic hardware is available today but most people are not ready for it. They must go through a learning process which can best be provided by a punched card system.

Punched cards provide an excellent means of input to a computer and the work done in developing a punched card system will not be wasted when a computer is installed.

ACCOUNTANT'S ROLE IN EDP

Accountants should play a dominant and central role in any conversion to

electronic data processing within the organization because so much data processing deals with accounting information.

A tremendous amount of skill and effort is required to convert a system to electronic data processing and to make the EDP system effective. EDP will affect the accountant's job and the education of those preparing for the accountancy profession. First, the accountant will find that electronics relieve him of routine report preparation and enable him to take on more critical tasks of analysing and interpreting reports. Second, the accountant will find it necessary to know something about the inter-action of the various functions of business in order to use electronic data processing effectively. Third, his formal education will need to include training in thinking logically and making effective decisions. Fourth, he will need increased imagination and creativity, as well as enthusiasm for the new methods.

THE LESSONS OF THE PAST

A number of lessons have now been learned from analysing successful and unsuccessful installations. The major lessons are these:

1. It is essential that top management be enthusiastic about EDP. A computer installation often creates changes in the structure of an organization and affects departmental boundaries. For this reason, top management should play an active role in making decisions which will ensure a smooth transition to a successful EDP system.
2. Many firms try to do too much with the computer all at once. This was probably at the root of the difficulties General Electric had in 1954 and 1955 with its Univac I at Louisville Appliance Park. Since then, however, the computer has demonstrated its ability to do more work than was originally conceived.
3. Most business record-keeping systems have grown up piecemeal over many years. EDP offers an exceptional opportunity to take a fresh look at the whole operation, and this is a must. When it is done, companies usually find ways to eliminate useless paper work and to produce new and more valuable kinds of reports.
4. Finally, there is no substitute for meticulous preparation and programming before the computer arrives. The eighteen months that it usually takes to get delivery on a big machine is a minimum amount of time to prepare properly. While the computer builder can offer training courses and other help, the responsibility for getting the computer running is one that the customer cannot delegate. This period provides an ideal opportunity to develop new skills in company personnel.

CONCLUSION

In conclusion, I would like to add one cautionary note. The true focus of this paper has not been the hardware of electronic computer systems, but rather what that hardware can do to illustrate how the electronic computer system makes it possible for you to design a data processing system which is different from anything you have had before. Unless you focus on the true requirements of your organization's information processing system and regard the computer hardware as merely a tool to help you achieve the desired objectives, you will run the risk of shackling the new and more powerful hardware with the antiquated chains of your organizational structure.

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INTEGRATED— ORDER THROUGH INVOICE

by Robert E. Rayner,
*Budgets and Systems,
Daystrom Instrument Division,
Archbald, Pennsylvania.*

The advantages of mechanization are many but before leaping into such a system, the accountant must plan long and well and prepare for it by simplifying current procedures. This article outlines an ideal data processing system, based on punched cards, which is integrated from receipt of the order to final invoice. The system is designed not only to aid accounting but to help in production planning and sales control as well.

THE WORLD is moving fast and we of the accounting profession must keep up with the pace. It is a challenge to all accountants to take a long, hard look at their systems and procedures with the thought of improvement and possible implementation by mechanization. External and internal pressures will cause all of us to make changes if we desire to keep up with our competitors. If we take the initiative, they will have to keep up with us.

Data processing is a more current phrase to describe the growing field of automation in the office. Integrated data processing indicates a near ultimate in processing flow of paperwork—or as a well-known accounting machine manufacturer calls them—"working papers," I like this term better because if any of the forms you are using do not pay for themselves, they are draining your profits.

The particular integrated system that is presented in this article is not currently in use by my company because it is not fully adaptable as such to our organization and may not be to yours. It does, however, point out what can be done with constructive thinking toward improvement. Certain liberties have been taken in order to be able to present most of the problems and uses that normally occur in this general system. It is not limited to the accounting department alone. An aid to production planning is introduced and the sales organization gets a boost in its control.

The system as presented evolves around a punched card, but with variations, parts of the method could be adapted to the keysort type of processing or even to some manual use with multiple purpose forms.

Rob-Est Industries is a fictitious company engaged in the manufacture of several product lines to customer requirements. It has some proprietary items, but these are a small part of its total sales. The organization performs subcontracted work for other companies along with prime contracts of its own. In such cases, supporting detail of items ordered, such as prints, specifications, and the like, is forwarded to the engineering and production control departments through a separate procedure.

It is assumed that the company has an order department as a part of the sales organization. This department receives all orders from the customers and handles

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ROB-EST INDUSTRIES

EXHIBIT 1

Order Office

- ☐ NOTIFICATION OF NEW ORDER
- ☐ NOTIFICATION OF ALTERATION
- ☐ NOTIFICATION OF CANCELLATION

PUNCH CARDS AS INDICATED. Column 5 is control column. Punch printed number.											
PUNCH IN ALL CARDS	<div style="display: flex; justify-content: space-between;"> 1 4 6 9 10 17 18 23 24 28 </div> <div style="display: flex; justify-content: space-between;"> CUST CODE Q.E. NO. PART NUMBER CUST PO NO. DATE OF PO </div>										
ORDER CARD	<div style="display: flex; justify-content: space-between;"> 9 </div> <div style="display: flex; justify-content: space-between;"> 5 29 34 68 74 75 77 78 79 </div> <div style="display: flex; justify-content: space-between;"> QUAN. ORDERED VALUE OF ORDER CODE TER </div>										
UNIT PRICE CARD	<div style="display: flex; justify-content: space-between;"> 8 </div> <div style="display: flex; justify-content: space-between;"> 5 29 34 35 40 61 67 68 74 </div> <div style="display: flex; justify-content: space-between;"> QUAN. ORDERED BAL. OF ORDER UNIT PRICE VALUE OF ORDER </div>										
SHIPPING SCHEDULE CARDS	<div style="display: flex; justify-content: space-between;"> 4 </div> <div style="display: flex; justify-content: space-between;"> 4 </div> <div style="display: flex; justify-content: space-between;"> 4 </div> <div style="display: flex; justify-content: space-between;"> 5 29 34 35 39 5 29 34 35 39 </div> <div style="display: flex; justify-content: space-between;"> QUAN. REQUIRED DATE REQUIRED QUAN. REQUIRED DATE REQUIRED </div>										
Prepare the following card(s) in case of new customer or address change.											
ADDRESS CARD -	<div style="display: flex; justify-content: space-between;"> 1 </div> <div style="display: flex; justify-content: space-between;"> 1 4 5 </div> <div style="display: flex; justify-content: space-between;"> CUST CODE </div>										
LINE 1: (6-29)											
LINE 2: (30-53)	<div style="display: flex; justify-content: space-between;"> 2 </div> <div style="display: flex; justify-content: space-between;"> 1 4 5 </div> <div style="display: flex; justify-content: space-between;"> CUST CODE </div>										
LINE 3: (54-77)											

PUNCHED BY:

PREPARED BY:

DATE:

DATE:

all changes. It controls the notification to the shop to produce for the specific order.

Orders for on-the-shelf items follow the same flow. These are controlled by a separate series of order entries.

RECEIPT OF ORDER

When the customer's order is received in the contracts division of the company, appropriate acknowledgement is made and the following process takes place. From

the information supplied on the purchase order a tab notification sheet is prepared (Exhibit I), giving the following pertinent information. In the case of new customers, it is necessary to prepare address cards for the permanent file. This is completed on the top portion of the form. In cases of repeat orders, it will not be necessary to complete the address portion. All that will be required is to include the customer code number for identification through the process. Other pertinent information regarding the order entry that is working through the shop and the purchase order number that we received is completed in the bottom part of the form. A separate card will be punched for each required shipping date on any particular part number. This will be used later in scheduling the pieces out of the door in the required time.

Some people will say that there is no need to copy the information on the customer's purchase order to the tab notification form. I firmly believe that it is necessary to have persons trained in their work to arrange systematically the necessary information for the tab operators. Tab key punch operators are basically production workers and we are interested in obtaining from them the utmost speed and accuracy. Such efficient operation cannot be maintained if the operator must constantly analyze the source document from which she is punching. It is an advantage to have the source document arranged in a logical sequence that will make punching easier and increase our key stroke per minute for each operator. It is also helpful in the training of new operators from the viewpoint that it requires less time to acclimatize an operator to the job.

TAB PUNCHING

When the notice is received from the contracts division, it will be necessary for the tabulating division to punch one or more of the following cards. An address card will be punched in the case of new customers. You will always punch an order card, a unit price card, and one or more shipping schedule cards that equal the total amount of the purchase order.

The unit price card will also be used as an inventory control record. From this card we would be able to tell the balance remaining on the order, the unit price and the total value of the remaining units. A summary of all unit price cards should tie in with the total of our backlog at the end of any period. These various cards are shown as Exhibits 2 through 5.

You will note that certain information is dropped from various cards and carried complete in others. The particular information that will tie all of these cards together is the customer code and the order entry number. Various part numbers ordered under one order entry will be identified by their appropriate number and within each part number the required shipping date will also be controlled on the shipping schedule card. When the first cards are punched, all four types of cards will be listed off in sequence showing the detail as a proof of the items punched and also providing a record of transactions if desired. In addition, this will serve as an order entry notification listing that can be distributed to the necessary parties. With some adaptations, the cards that are prepared may be used to perpetuate a loose-leaf type of order entry register. From the order cards, a total value of new orders received during any given period can be made up. This will generally be on a monthly basis and will show the total new business received for the month. If these cards were then sorted by sales

[illegible]

of shipments for each day of the week, month, and year. Once we have had these cards punched, any other report that you desire could be rearranged using the information on this card that is punched.

DISPOSITION OF CARDS

The address cards are merged into the master file of addresses that is maintained in the tabulating department. In developing the customer code, it may be well to assign a prefix number to the code to classify them into the letters of the alphabet. With a four-digit code, we could use the first two digits from 01 through 26 to signify A through Z and the last two digits from customer #1 through customer #99. If you have more than 99 customers in any one alphabetical grouping, this code could be expanded another digit to include 999 individual customers.

The unit price card will be merged into the file by customer number and order entry number. This will make the card available for future use when we ship out the items and call upon the unit price card to do our calculations. The shipment-required cards are merged into the open file by shipping date required and part number sequence for each order entry. This is done so that it will be easier for the shipping planning clerk to pull out the appropriate part number on the date that it must be shipped. The end result would be to have the shipping schedule file held in required-shipped date sequence and by part number within each day.

USE OF THE SHIPPING SCHEDULE CARD

The shipping schedule card is the key to the entire operation. It is from this card that we have indicated our shipping load and it is from this card that we will begin to accumulate the information needed to write the invoice to the customer. For use in planning, the updated file is run weekly to give a printed record of what must be shipped for the following week. Cards can also be sorted by part number so that an analysis may be made in the production planning department for each part number and the date on which it is to be shipped.

Each day the shipping planning clerk will pull the cards from the file that are to be shipped on this date. These cards will be forwarded to the storeroom and become the authorization for stores withdrawal. (May I inject here that the most efficient method of shipping is used in this theoretical problem, that is to pack the article today and ship tomorrow.) The items are withdrawn from stores and identified with the appropriate part number and quantity actually pulled from stores, and sent to the packing department along with the shipping scheduling card.

While the individual parts are being packed, the shipping clerk is preparing the shipping document for each order. In the case where more than one item is being shipped to a certain customer on one shipping document, it might be well to hold off the writing of the shipping document until packing is completed. In the cases where a separate shipping document is prepared for each item, this would not be necessary.

On the shipping schedule card, the clerk manually fills in the shipping document number on which the items were shipped out. He also stamps the date shipped and inserts the actual quantity shipped. The reason for inserting this quantity is that we may be shipping less than the amount required on this date due to shortages in production, etc. You will see how this problem is reconciled later on in the processing. At this point, the shipping scheduling cards are forwarded to the tab room for further processing.

There are some possible variations in the method of preparing our shipping document. Some would say that we should use the shipping scheduling card to write the shipping document on electric machine equipment. However, there are some problems that might prevent this. In some cases, additional information is required on the shipping document. This information may be in a format that would not lend itself readily to the use of punched cards. I believe that it would be well if the shipping document were typed manually within the department and carried all pertinent shipping information. We will prepare the invoice in a separate procedure using the shipping scheduling card as the basic document. The alternate method, of course, is to use the shipping scheduling card to write the shipping authority. This is not impossible, but in the type of business described, it would probably be preferable to use the first method.

PREPARATION OF THE SHIPPING CARD

When the shipping scheduling card is received in the tabulating department, the shipping document number, the quantity actually shipped, and the date on which the order was shipped are punched into the card in the appropriate fields. This card is then matched with the unit price card that is in the file and the quantity shipped is multiplied by the unit price to get the total value of the shipment. At the same time, we carry forward the unit price into the shipping scheduling card and also calculate the balance due on this particular shipment. This is arrived at by subtracting the quantity actually shipped from the quantity that should be shipped on this particular date.

If you recall, we had established the unit price card as the inventory control card on a particular part number. We are now able to adjust the value of the order by the shipment that was made on this date. The balance on the order is reduced by the units and the value of those units of the shipment made to get a new value of the order.

We also have available now the card by which we will write the invoice to the customer and thus come around to completing the circle. Using the shipping scheduling card as punched and calculated, we will match out by the customer code number the appropriate address card for the customer. Passing these through the tabulating machine, we are able to write the invoice that is shown as Exhibit 6. After the invoices are written, the cards used in writing the invoice are passed through the collator to separate the address cards and shipping scheduling cards. At the same time, we select those cards which do not have a zero balance on the particular order. These cards are then reproduced, dropping all of the information that was punched into the card after it was received from shipping. The balance of the order is transferred to the quantity-required field. It is now placed in the shipping file as a back order item. Thus, when the next shipping items come up, this card will be the first in the group to be filled before any orders for future dates.

OTHER REPORTS

At the end of an accounting period, the unit price cards can be run to get a total backlog of business in the house and needing shipment. The shipping scheduling cards that are now in the shipping department can be pulled back into the machine room and an aging can be run of the backlog by months. Items such as this are of great interest to the budget man in your organization in forecasting the shipments

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While electronic accounting machines are indeed a great help in industry today, they can prove expensive in a particular company. Before one rushes into the magic and excitement of electric accounting machines, one should first evaluate the effectiveness of current procedures. Effective planning up to six months or one year will more than pay for itself in installation savings, both in dollars and headaches. It is much better to work out the system beforehand than at a time when expensive equipment sits idly by in your processing section.

In many cases we can improve our organization merely by improving our procedures. After you have developed the procedures and the operating level of your personnel to the minimum required to operate the job efficiently, then compare your operations at that point with operations using mechanical methods. Too often machine sales personnel try to sell us on the savings that will exist if we put in machines. (This is also true sometimes within your organization.) You will probably experience some savings and you may also experience a higher cost. These machines have insatiable appetites for information and must be kept fed if they are to pound out their information hour after hour. One of the dangers that lurks in the background is that we may add people to supply this machine with information we got along without before.

Now I am not advocating that we disregard the effect of mechanical methods of accounting, as they are a part of the accounting world today. I am merely saying that we should be careful not to plunge into these things without proper planning and evaluation of our present efforts. Many machine men and especially those engaged in sales will feel that this is not true. However, from my experience in the justification of mechanical methods, I have found that great savings can be made through the improvement of manual methods before we go into the intricacies of machines. A company may be able to save \$100,000 a year through the installation of machines, but through improvement of manual methods, rearrangement of the flow of work, and good evaluation of the reports prepared, we may very well equal or exceed the \$100,000 savings. Then look to the mechanization of your office for further savings. Now you have taken off the salesmen's cream and are in a better position to compare and beware.

On the other hand, there may be many reports needed by your company to carry on its operations effectively that it can not have now because of lengthy manual preparation. Management today needs a set of tools that is comparable to the set of tools used by the machinist in the shop. We cannot expect our machinists to produce good products if they do not have good tools. In the same manner, management cannot turn out the good products of a plant if it does not have the necessary management tools, namely reports and statistics by which it may evaluate the trend of business and plan better for the future operations of the company. Tool up for better management, but design your tools first.

For further reading

ELECTRONIC BILLING AND STOCK CONTROL, by H. C. Moog, *The Controller*, Nov.-Dec. 1956.

ONE APPROACH TO IDP INVOLVING ORDER AND INVOICE PROCESSING, by E. J. Winters, *Cost and Management*, Dec. 1958.

ORDER WRITING WITH PUNCHED TAPE AND CARDS, by R. D. Findlay, *N.A.A. Bulletin*, Sept. 1957.

The Thorne Group Ltd.

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The Economic SCENE . .

by J. V. Poapst,
School of Business,
University of Toronto

PRICE TRENDS

INTIMATELY connected with Canada's first-ranking economic problem of unemployment is the problem of prices. Increases in domestic prices when they affect costs affect the ability of Canadian producers to employ labor. Concern over its effect upon prices has made monetary authorities cautious about combatting unemployment by substantial monetary expansion. There appears to have been a lingering concern over inflation despite the existence of high levels of unemployment and unused industrial capacity. Price trends, past and potential, are at the heart of the current "Great Debate" on Canada's economic problems.

Price trends in the post-war period are indicated in the table below. The figures show average annual rates of change in nine Canadian price series. Seven of the indices relate to goods and services purchased at the retail and wholesale levels. The two other series are for services purchased by producers from important sectors of the labor and capital markets.

PERIODIC AVERAGE ANNUAL RATES OF CHANGE,¹ SELECTED PRICE INDICES, CANADA, 1946-60
(Per Cent)

Index (1949 = 100)	1946-51	1951-6	1956-60	
			Period	1959-60 only
Consumer Goods and Services—Total.....	9.3	0.8	2.1	1.4
Food	13.4	-0.6	2.0	1.0
Shelter	4.9	3.2	2.1	1.7
Other Commodities and Services ²	5.1	1.7	3.5	2.2
Wholesale ³ —General.....	14.6	1.2	0.6	0.0
Fully and Chiefly Manufactured.....	15.1	0.9	1.2	0.2
Non-residential Building Materials.....	11.6	1.6	0.9	0.5
Wages—Av. Hrly. Earnings in Manufacturing ⁴	13.2	5.8	7.5	4.0 ⁵
Yields on High Grade Corporate Bonds ⁴	2.8 ⁶	2.8	4.3	4.7

¹Average change per year as percent of value of index at start of period. ²Excludes clothing and household operations. ³Converted arithmetically from 1935-9 base. ⁴Based on annual averages of monthly values expressed as percent of values for 1949. ⁵Excludes December, 1960. ⁶December 1947 to 1951. Sources: D.B.S., McLeod, Young, Weir, Co.

The post-war years divide into three periods. The first, 1946-51, is characterized by rapidly rising prices. In the second, 1951-6, prices rose slowly. Prices paid by consumers for food and for clothing (not shown) actually declined. The third period, 1956-60, was again one of rising prices. The Consumer Price Index and the measures of wages and bond yields increased at higher annual rates than in the previous period. The General Index of Wholesale Prices increased at a lower rate than during the period 1951-6. Prices rose in 1960, but with the exception of corporate bond yields, all the series shown increased at a rate below that for the last four years.

Over the period 1946-60 the Consumer Price Index increased by 65% and the General Index of Wholesale Prices by 66%. Conceptually, these changes measure only increases in prices. Contrary to popular impression, the increases should not be discounted to allow for improvements that have been made in the quality of many products. This has already been done by the statisticians.

The trends of consumer and wholesale prices differed over the post-war years. The General Index of wholesale Prices increased at a decreasing rate from period to period (14.6%, 1.2%, 0.6%). From 1959 to 1960 it was constant. The annual rate of increase in total consumer prices was initially high (9.3%) and then low (0.8%) and then higher again in the third period (2.1%). The rate of increase in consumer prices was thus less than that for wholesale prices during the first post-war decade, but higher for the last four years. The latter condition is attributable in large measure to increases in costs of services purchased by consumers. "Other commodities and services", which have a weight of almost one-third in the consumer basket of goods and services, increased at a rate of 3.5% per year from 1956-60. Producers of services do not have to contend with import competition. They must also pay competitive wages while enjoying fewer opportunities to increase productivity per man-hour.

The rate of increase in interest rates differed from that of other prices. In the period 1946-51 while other prices were increasing rapidly corporate bond yields rose by only 2.8% per year. Pegged until 1951, nearly all the increase in interest rates took place in that year. From 1951-6 corporate bond yields again increased at an annual rate of only 2.8%. In the period 1956-60, however, the rate of increase rose to 4.3% as widespread concern over inflation developed among investors. While wholesale prices only inched up, the most widely publicized price measure, the Consumer Price Index was increasing at a faster rate. Its sizable increase during the recession of 1957-8 was particularly disturbing.

Will prices (other than interest rates) continue to increase at no more than the relatively slow rates of 1960? Some current conditions argue for an affirmative answer, but there are uncertainties. The high level of unemployment, excess capacity in some industries, the revival of foreign competition and the fact that monetary expansion in 1960 was more limited than in the recessions of 1953-4 and 1957-8 are all conditions conducive to price stability. The restrictive effects of these conditions can be overestimated, however. If the demand for labor increases it does not automatically follow that the unemployed will have the right skills in the right places at the right time. Similarly demand can expand in industries in which there is little excess capacity while excess capacity persists in other industries. Foreign producers do not compete with Canadian businesses in all industries. The lower inflationary potential from the limited expansion of the money supply probably has been partly offset by increased ability on the part of corporate treasurers to speed up the turnover of their cash balances when necessary. In addition the general public in both Canada and the U.S. has large holdings of liquid federal government securities. Finally, the government's efforts to insulate the Canadian economy a little more from foreign competition should not be overlooked. More effective tariffs and a lower exchange value of the Canadian dollar imply higher Canadian prices. The fires of inflation are not flaming as in the past, but they are dormant rather than dead.

A MECHANIZED ACCOUNTING SYSTEM FOR A PULP AND PAPER MANUFACTURER*

*by G. S. Knights,
Manager, Data Processing,
E. B. Eddy Company,
Ottawa, Ontario.*

This article outlines a practical and simple application of a mechanized accounting system. Emphasis has been placed on the method of operation of the accounting system rather than upon the original makeup of the system itself, the object being to provide an overall appreciation of the capabilities of mechanization if a proper system and program is provided.

IT IS UNFORTUNATE that so much publicity and fanfare heralded the advent of computers. Many potential users had heard so much about their unbelievable speed, accuracy and ability that, when they came to make a study of how one would be used, the results were quite disappointing.

Almost to a man, consultants and manufacturers' personnel insisted on the "overall approach", whereby the whole office structure must be changed and redesigned to accommodate the computer selected. The cost of such conversion is, of course, extremely high. It is the writer's belief that a step-by-step conversion can be carried out with the result resembling the system described herein.

The accounting system of the company on which this article is based is not completely mechanical but it is the aim to make it so eventually. Even as the writer outlines the system, he is aware of many areas where improvements and refinements are already planned. However, the aim is to present a practical and simple application of a mechanized accounting system. Many details are purposely left out to avoid confusion so that the reader who is interested, and is contemplating the move to electronic accounting machines, may get an overall appreciation of what such machines can do if a proper system and program is available to arrange and prepare the basic data.

A standard process cost accounting system is used. Costs of sales and inventory are carried at standard cost, but are adjusted to actual for statement presentation. The account classification does not show the variance accounts for this reason.

The company, which shall be known as the General Paper Company Ltd., has its own filtration plant and powerhouse. Six paper machines are in operation; four produce a wide range of bond, printings, book paper, offsets, bristol, and other light weight specialty papers, and the other two are newsprint machines. The annual volume of business is about 70,000 tons of specialty papers and 150,000 tons of newsprint.

* Condensation of a Thesis submitted for R.I.A. qualification.

Mr. Knights, a Registered Member of the Society of Industrial and Cost Accountants, was born and educated in Pembroke, Ontario. He joined the E. B. Eddy Company in 1951 as a tabulating machine operator in the Data Processing Department and is now Manager, Data Processing.

GENERAL ACCOUNTING SYSTEM

When discussing accounting, attention is invariably directed to statements resulting from the routine of daily operation. The value of most statements is closely related to the time of preparation. The older they become, the less valuable they are as management tools.

It is reasonable to summarize the situation by saying that accounting statements must be:

1. Produced with all possible haste
2. Produced at reasonable cost
3. Accurate.

The General Paper Company feels that this can only be done by using a punched card machine accounting system with a random access type of computer.

Because machine systems are less awkward when numerical coding structures are used, the general ledger accounts have been given three-part codes as follows:

Part 1—Balance sheet code—major classification

2—Account code—intermediate classification

3—Further breakdown of account—minor classification.

This numerical coding is carried into the breakdown of control accounts for departmental purposes.

Following are two examples of coding:

61 — 025 — 600

represents stationery charged to general accounting

60 — 005 — 010

represents direct labor charged to the woodpile.

The first part of the code signifies the control account to be charged, the centre portion represents the type of expense and the final portion, the department charged.

For the sake of speed and accuracy the general ledger is maintained in computer memory, each account having the descriptive name, account number and balance. Since all entries to the ledger are made in punched card form, the cards are saved so that a detailed ledger can be printed for auditing purposes. Entries generated by the machine as a result of programs written to perform closing entries, etc., must also be punched in order to keep a detailed cardfile available.

Subsidiary ledgers, because of the large card volume and numerous accounts, are maintained in card form and are verified to the control account after the month-end closing and while the completed subsidiary ledger is being listed (*See Exhibit 1*).

ACCOUNTS PAYABLE

Accounts to be paid are derived from two sources:

1. Financial and cash items as outlined by approved cash vouchers
2. Items covered by purchase orders.

The cash voucher form contains information needed by the accounts payable department in order to issue a cheque in payment, or by the cashier to pay cash to the party presenting the properly authorized voucher. This information consists of the vendor number (numerical equivalent of the person to whom the cheque is to be made payable or, in the case of cash items, it will be part of a cheque to petty cash), the voucher number, the amount of the cheque, the account or accounts to be charged and the amount charged to each. Cash vouchers are forwarded to the

THE GENERAL PAPER CO

THE GENERAL PAPER COMPANY LTD.

ITEM		DESCRIPTION		UNIT		ACTIVITY DATE		QUANTITY		QUANTITY		MINIMUM BALANCE		AMOUNT	
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PURCHASE ORDER DETAIL

data processing department where two or more cards are keypunched from each voucher. One card forms the basis for issuing the cheque, containing voucher and vendor number, date and amount (See Exhibit 1). One or more cards are punched

containing voucher and vendor numbers, account to be charged and amount to be charged to each. These cards are accumulated until the month-end and form part of the entries to the general and subsidiary ledgers.

Suppliers' or vendors' invoices require a different treatment as most affect the stores inventory maintained by the company. Since all such invoices are covered by a purchase order issued by the purchasing department, a brief description of this phase of the system is necessary to appreciate fully the method used.

PURCHASING AND RECEIVING

From time to time every department in the organization requires goods or services, and so either a purchase requisition or a stores requisition is initiated. A purchase requisition with the information required, properly signed, is forwarded to the stores department where it is examined to ensure that the goods requisitioned are not presently in stock. If the goods are in stock, the purchase requisition is returned to the originator and a stores requisition card is requested. If the goods are not in stock, the purchase requisition is approved and forwarded to the purchasing department.

When purchasing has decided on a vendor, his number is inserted on the requisition. At regular intervals, all requisitions are sent to the data processing centre where information peculiar to these requisitions is keypunched into *Exhibit 2*. One card is punched for each line of the body of the purchase order. An additional card per order is punched with variable data such as name of carrier, f.o.b. point, date of shipment, etc.

During the printing of the purchase order, a punched card receiving report is produced, one card for each item containing the purchase order number, stores item number, if applicable, description and quantity to receive (*Exhibit 3*). The punched card receiving reports are forwarded to the receiving room and filed in purchase order number sequence.

As goods are received, the receiving clerk enters the quantity in the space provided on the punched card receiving report. If the shipment is incomplete and more goods are to follow, the clerk will mark the card as such. The receiving reports are then forwarded to the stores record clerk.

STORES ACCOUNTING DEPARTMENT

The stores record is maintained in punched card form with two card files, one in item number sequence and the second in alphabetical order. The alphabetical file, properly indexed, is used by the stores clerks to insert item numbers on requisitions received.

The numerical file constitutes the stores ledger. The card (*Exhibit 1*) contains the item code, description unit price, quantity on hand, re-order point and code signifying order placed. The filing cabinet is constructed in such a manner that cards can be offset in the file for easy removal. There are some 40 thousand items in store.

The stores requisition is in punched card form. Only one item per requisition is allowed. The requisitions are made up in book form with paper copies interleaved and distributed to individuals with authority to issue such requisitions. The originator inserts the date, delivery point, quantity, description of item and account charged. The requisition is then signed and presented to the stockroom. When the goods are issued, the stores code and quantity issued are inserted.

The requisitions are then passed on to the stores record clerk who keypunches the account charged and quantity issued into the card. At this point, the requisition number is inserted in the card. This number is merely a (consecutive) number used for locating the requisition at a later date. The paper copies of the requisitions are distributed as follows:

- (a) retained by requisitioner
- (b) returned to requisitioner by stock room as having been filled.

After completion of punching, the requisition is filed by the stores record clerk behind the balance card (*Exhibit 1*) and both are offset for later removal. (Returns are handled in a similar manner, being of course, a debit to stores.)

RECEIPTS

When the punched card receiving reports are delivered to the stores record clerk, they are separated into two groups:

- (a) Stores items
- (b) Remainder.

The stores items will now have the quantity received punched in the card as well as the code indicating shipment not complete. These receiving reports are filed behind the balance card and offset in the file.

At a specified time, the stores record clerk will remove all offset cards and forward them to the data processing centre along with group (b) mentioned under receipts.

The cards, excluding group (b), are processed through the computer where the following will take place:

- (1) The daily stores activity is listed
- (2) Cards are punched as follows:
 - (a) one card for each issue (*Exhibit 1*) containing requisition number, stores item number, account charged, quantity and dollar amount
 - (b) An updated stores item balance card
 - (c) One card for each receiving report, with the addition of the unit cost and amount
 - (d) One additional card for each receiving report showing shipment not complete
 - (e) One card for stores items which have reached the re-order point.

The daily stores activity list is sent to the stores department. The cards are disposed of as follows:

1. The newly punched issue cards are used to punch the price and dollar value in the original requisitions. The originals are filed. The duplicates to be used in preparing ledgers are filed in their respective ledger files.
2. The updated stores item balance cards are returned to the stores file.
3. The newly punched receipts cards are used to punch the dollar value in the receiving reports and this amount plus the unit price is printed on the card. The receiving reports are merged with the balance of the receiving reports (referred to previously as group (b)) and a listing prepared of all items handled by the receiving department. The cards are forwarded to the accounts payable department, the list to purchasing and receiving. The duplicate receipt cards are destroyed.

THE B 5000, WHICH SETS NEW STANDARD IN



WARD IN PROBLEM SOLVING & DATA PROCESSING

The new Burroughs B 5000 Information Processing System is marked by dramatically different machine logic and language. It is a decided departure from conventional computer concepts and sets:

NEW STANDARDS OF PROGRAMMING EFFICIENCY. The B 5000 is the first system specifically designed for efficient use of ALGOL and COBOL. It compiles 20-50 times faster than any other computers. Result: unprecedented savings in programming cost and time.

NEW STANDARDS OF PROGRAM-INDEPENDENT MODULARITY. Any B 5000 program works with any B 5000 system configuration. And you can add memory modules, input/output units—even a functionally independent second central processor. Result: you can gear system expansion to work-load growth, without reprogramming; you are protected against obsolescence.

NEW STANDARDS OF EFFECTIVE MULTIPLE PROCESSING. The B 5000's normal mode of operation is automatic multiple processing of related or unrelated problems. Programs that are written independently can be processed simultaneously. Result: minimum idle component time, maximum self-regulating system efficiency.

NEW STANDARDS OF AUTOMATIC OPERATION. The Burroughs new B 5000 incorporates complete operating, monitoring and service routines; automatically schedules work and assigns memory and input/output units. Result: system idle time and human intervention are held to a minimum—important time and dollar savings.

NEW STANDARDS OF SYSTEM COMMUNICATION. The new B 5000 features complete, fully flexible communication among its components, permits simultaneous on-line/off-line operation. Result: greater flexibility and reliability in systems use.

NEW STANDARDS OF THROUGH-PUT PER DOLLAR. The B 5000 also offers three microsecond add execution time and six microsecond memory cycle time. It reads 800 cards per minute, prints 700 lines per minute. And it's solid state, of course. This large-scale performance is available to you in the medium-price range.

For details in depth, call our nearby office now. Or write Burroughs Adding Machine of Canada, Limited, Toronto, Ontario.

Burroughs—TM



Burroughs

"NEW DIMENSIONS / in electronics and data processing systems"

4. Cards for receiving reports showing incomplete shipment will show the balance between the quantity ordered and received. These cards are reproduced to blank receiving reports (*Exhibit 3*) and sent to the receiving department to be used when the balance is received.

5. Cards for stores items reaching the re-order point are forwarded to the storekeeper who will take steps to see if the item should be re-ordered. If so, a purchase requisition is initiated. The storekeeper then turns over the cards for goods re-ordered to the stores record clerk, who will select the balance card and punch a code to indicate re-order has been made.

The accounts payable department must now match the receiving reports with the appropriate purchase orders and suppliers' invoices. For non-stores items, the receiving reports are stapled to the invoices and, after the accounts charged and amount charged have been handled, the invoices will follow the flow outlined for cash vouchers. Stores items require further treatment. The stores item receiving report has the dollar value at the current unit price printed on the report. If this price compares favorably, the receiving report is attached, the amount showing on the receiving report is charged to stores and the balance, if any, is charged to a special account which is expected to "wash out" with over-ages and under-ages. If the difference is substantial, the new unit price is computed and marked on the receiving report which is then returned to the stores record clerk. The card is re-filed behind the proper item code and, when run the second time through the computer (with the next day's activity), the old and new unit prices will show. The quantity will not change; the new unit price will appear in the new balance card and the dollar value of the change in price, times quantity, will appear in the receipts column identified by a symbol to distinguish it from a quantity received. This amount must be added to the stores control account. This time the receiving report will match favorably with the supplier's invoice which will be passed on for payment.

The stores control account in computer memory is updated daily with the value of issues and receipts and adjustments due to price changes when the stores activity is listed. At the end of each accounting period, the stores ledger file is passed through the computer and the dollar value of the ledger accumulated for comparison with the control account.

Since it is virtually impossible to take a complete physical inventory at any one time because of the number of items maintained, sections are counted at various times throughout the year. From the stores balance cards, a card is punched with the stores item number and description which are printed on the card for easy reference. These cards are given to the storekeeper who will instruct inventory takers to mark-sense the quantity for each item in the allotted space. When completed, the marks are converted to punches, the physical inventory cards are merged with the balance cards and processed through the computer which will list discrepancies. These discrepancies are then investigated and the proper adjustment is made.

ACCOUNTS RECEIVABLE

The accounting for receivables is not too significant in the presentation of a cost accounting system but, because it lends itself so completely to mechanization, it is worth mention on that basis alone. The following is a brief description of the procedure followed, but no exhibits are given.

The orders are originally prepared in the sales department but, of course, pass through several departments before reaching the central filing room. Orders are

sent to the planning department to ensure that stock is available or the order is scheduled for production. When shipment is made, the shipper must insert the quantity shipped, the traffic department must prepare bills of lading, and the pricing department must insert prices and additional charges, discounts and other adjustments.

Upon entry to the data processing room, cards are punched from the now completed order form. One card per order is keypunched. An additional card is punched for each product line on the order showing the grade code, quantity shipped and price.

When a sufficient quantity warrants its use, the computer is geared to prepare invoices. The cards are fed into the machine and the completed invoices are printed. Names of customers and description of grades are stored in the computer and used when necessary. The auxiliary printer prepares a daily invoice register. Two types of cards are punched, one accounts receivable card for each invoice and one sales analysis card for each grade on each invoice. (This company desires an extensive analysis of sales and, therefore, results of sales are accumulated in card form instead of machine storage.)

The accounts receivable cards are filed in an active accounts file. They are removed when payment is received and listed, with the cash account and accounts receivable accounts being posted.

When all sales for the accounting period have passed through the data processing department, invoices have been prepared and all accounts receivable activity for the period has been completed, the accounts receivable card file is used to prepare statements to customers advising them of the outstanding invoices in their account.

During the preparation of statements, the auxiliary typewriter prepares the aged trial balance. Certain customers pay monthly from statements and of these a number sufficiently large to warrant the use of the computer are presented with drafts. Since only one line of variable information is required for each draft, a card is punched when the statements are being prepared, one for each customer who will receive a draft. The continuous form drafts are printed from the above mentioned cards.

PAYROLL AND LABOR DISTRIBUTION

The labor report consists of a punched card which is a combination clock card and labor report (*Exhibit 4*). A master file, one card per employee, is located in the data processing department in which the location and clock number of each employee are punched along with his normal distribution code and rate per hour. The file, which of course is revised constantly upon notification by the industrial relations department, is reproduced each day with the above punching, plus the date, the clock number imprinted in the block at the left end of the card, and all punching interpreted along the top edge of the card. This new set of cards represents the labor reports for the following day and is turned over to the timekeepers for insertion in the card racks near the time clocks.

When an employee punches in at the beginning of the day, he takes his clock card with him. The foreman completes the report for the employees as follows:

1. Marks the number of hours worked under the normal code.
2. Describes the operation, fills in the account charged (if known), rate and hours if the workman works under further cost centres. Each job carries a

rate of pay and the employee performing the task receives that rate. This accounts for the change in rate for the same employee.

At the end of the day or shift, the foreman signs the cards and notes the time signed. Each card is picked up by the employee who punches out and deposits his card in a locked box for the timekeeper. Upon receipt of the time cards, the timekeeper examines each card to see that hours reported agree with hours punched and mark senses, in the space provided, the number of lines completed. The timekeeper also inserts missing codes or corrects erroneous codes.

The time cards are passed on to the data processing section where a card collator will insert the desired number of blank cards behind each report in accordance with the digit marked by the timekeeper. A keypunch operator then completes the cards according to the completed time card.

The computer storage carries three files for labor purposes:

1. Additional employee data such as income tax exemption, unemployment insurance category, etc.
2. Accumulating hours and dollars by clock number
3. Accumulating hours and dollars by account code.

Each day the completed labor cards are passed through the machine after being sorted in account code sequence and files 2 and 3 above are updated simultaneously. The daily labor analysis, *Exhibit 7*, is listed and forwarded to the industrial relations department for distribution to the proper personnel. The time cards which have since been sorted in employee number sequence are filed in the industrial relations department.

The company pays its employees weekly. Time reported up to midnight Saturday is included in cheques distributed the following Tuesday. After Saturday's labor has been recorded in the computer storage, a program is introduced to the machine which causes the payroll cheques to be printed. A card file of year-to-date earnings is passed through the machine and the output cards will have the current week's figures added to the previous amounts. While cheques are being prepared, the auxiliary typewriter prepares the payroll register.

The total payroll when completed is posted to the proper accounts with the gross payroll being debited to accrued wages.

At the end of the accounting period (month-end), another program is used to punch a card for each account in computer storage. The cards are distributed to the various ledgers to which they are coded and the total is credited to accrued wages. The balance left in this account at this time is the month-end accrual. The control account, as indicated by the distribution code, is debited as each account card is punched. The cards will, of course, be distributed to the various subsidiary ledger files.

BUDGET PLAN

It is impossible to operate an efficient standard cost accounting system without some form of budget plan. The following plan has been established for the General Paper Company:

1. Sales budget or forecast
2. Production schedule
3. Manufacturing budget
 - (a) Material budget

EXHIBIT 7

[illegible]

Labor
Maintenance
Other overhead expenses
Fixed expense

THE GENERAL PAPER COM

THE GENERAL PAPER COMPANY LTD.

DATE	DEPT	RUN NO.	GRADE	MTL OR BS MT	MATERIAL QUANTITY	MACHINE HOURS	LOST TIME HOURS	PRODUCTION QUANTITY	BROKE QUANTITY	YEAR TO DATE										
										CURRENT MONTH										
											YEAR TO DATE									
											</									

MATERIAL BUDGET

The bill of materials for making paper is called "the furnish." Different grades of paper have different furnish formulae. These formulae are, of course, originated by technical personnel in the research department. From time to time, changes in furnish may be made. Where such a change takes place, it is carried through to the standard cost.

The production forecast states the grades to be produced and the tonnage of each grade. This schedule is then extended by the furnish for each grade to arrive at the total quantity of materials required.

The pulp mills can now plan their operations accordingly, as they are aware of the quantity of pulp the paper mill intends to use. The cost of pulp cannot be found, however, until the entire budget for the pulp mills is complete. The purchasing department will base the price of the remaining materials to be used on past experience to some extent, but mostly on contracts signed and on a survey of the market and a study of expected prices. Assuming we have established the cost of manufactured pulps, the standard material cost is established for our production forecast.

CONVERSION EXPENSE BUDGET

The cost of converting raw materials to paper, or conversion expense, is made up of labor and overhead. Some overhead expenses can be associated directly with each department. Others must be apportioned to departments on the most accurate basis. Expenses are collected by department on *Exhibit 8*.

Labor—Direct and indirect labor for each department is determined by the number of employees required to operate the department. It should be noted that, in the case of the paper machines, the type of paper being produced determines the size of the labor force. Since the company has a signed contract with the unions, labor rates are known in advance. The standard labor cost is then easily obtained when the hours have been established.

Maintenance—The cost of maintenance is established by the chief plant engineer and mechanical superintendent. These personnel estimate the maintenance for the coming year and the labor and material cost of carrying out such maintenance for each department.

Other overhead expenses—The remaining expenses are estimated for each department by the chief cost accountant. A study of the departmental expense budget will show a portion of the cost of each department is made up of fixed expenses. These expenses and non-productive department expenses are distributed on various bases depending on the nature of the charge or service.

STANDARD GRADE COST

To complete our standard cost system it is necessary to establish a standard cost for production not by departments, as has just been done, but by quantity of paper produced. Such a standard is prepared by using *Exhibit 9*, standard grade cost. This form is prepared mechanically with some information being filled in later by hand.

Basic information needed for the preparation of this form is as follows:

- (a) *Materials*: each type of raw material is given a numerical three-digit code for handling ease in our mechanical system. The quantity of each material per 100 lbs. is also required. This information is keypunched into the card. *Exhibit 5*, along with the grade code from the furnish formula.

Example 8

COVERING ONE MONTH, YEAR 19

ACCOUNT CLASSIFICATION	
V	VARIABLE - PER UNIT
F	FIXED - PER PERIOD
C V	CURVE - VARYING BUT NOT
C F	PROPORTIONAL TO PRODUCTION

MILL	DEPT No.
DEPARTMENT	

STANDARD UNITS	

[illegible][illegible][illegible]

EXHIBIT 9

CODE No.

YEAR 19

MACHINE No.

DATE CALCULATED

	GRADE	DATE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

Basis Weight

CALCULATED BY

CHECKED BY _____

MATERIAL COST

[illegible]

BROKE COST

BROKE NO.	BROKE VALUE		AMOUNT DOWNGRADED	
	INCR.	FULL	INCR.	FULL

FINISHING COST

[illegible]

S.A.M. COST

CONVERSION INDEX							
ADMINISTRATION	% OF CONVERSION INDEX						
STAND-BY EQUIPMENT	% OF CONV. INDEX						
FINANCIAL	% OF FACTORY COST						
SELLING	AMOUNT PER 100 POUNDS						
ADVERTISING	AMOUNT PER 100 POUNDS						
S.A.M. COST PER 100 LBS.							

- (b) The production standards and methods department, in consultation with the machine operators themselves, determines the productive rate (pounds per hour produced) for each grade.
- (c) The machine hourly cost, determined from our budget, has been stored in the computer.
- (d) The finishing department budget will furnish the cost of finishing each grade. (The paper loss is assumed to be a percentage.)

When the above information is punched (items a and b) or stored in the computer (items c and d), the introduction of the punched cards will cause the machine to print the standard grade costs.

The above operation leaves the computer storage with the following information:

- 1. Raw material code and unit cost
- 2. Grades costed, cost of furnish, unfinished paper cost, pounds per hour, finished paper cost
- 3. Hourly cost of machine.

Wood pulp, the main ingredient in paper, is of course a very important part of our raw materials. Since it is impossible to describe the system for all departments, the paper mill has been dwelt upon. The reader must assume that pulp produced by the two pulp mills is "sold" to the paper mill. The unit cost of pulp as shown in the various furnishes is the standard cost based upon our budget. This cost is based upon a certain normal activity. If this activity is not attained, the deviation from standard may be large enough to warrant an adjustment of our unit costs for pulp. In this article, we must assume that the problems of costing pulp are similar to those of costing paper.

To close the budget system, it is now possible to cost our production forecast. The cost of such a forecast can be established by grades. After applying a fair percentage of selling and administrative expenses to each grade, the cost of production is established. Considering the amount of production to be classed as inventory and sales, an estimated profit and loss statement can be prepared.

THE PLAN IN ACTION

(A "run" of paper is the amount produced during a given time)

Run reports:

This report, *Exhibit 10*, is prepared by the data processing department immediately after the run of paper is completed. It outlines the results of the run to the paper machine superintendent and to all other interested parties. It gives a comparison of actual and standard cost and is instrumental in initiating corrective action where needed. The report is prepared from the following documents (not illustrated):

- 1. Stock preparation report—

While we would assume the standard furnish formula for the grade to be made should give the exact quantities of raw material to be used, the paper maker may for various reasons not be able to do this. In order to put out the proper product, changes may have to be made to the furnish. The beaterman therefore records the actual amounts of materials put into the process on this form.

- 2. Machine tender's daily record—

The machine tender keeps a record of machine hours for the shift and the number of hours spent on each run. Since conversion expense is charged on an

EXHIBIT 10

number and quantity, one card for each material.

Machine tender's daily record: grade code, run number, department number, machine hours and lost time hours.

Unfinished production report: grade code, basis weight, run number, department number, quantity produced, quantity of broke.

The above cards are fed into the computer where the following takes place to produce the run report:

1. Raw materials used are extended by the unit cost to give the standard cost of materials actually furnished.
2. This is compared to actual pounds used at the standard furnish cost to produce a use variance.
3. The production realized from the above pounds of material furnished, increased by the value of broke, is compared to the production that should have been realized from the above furnish to produce a material yield variance.
4. The actual hours required to complete the run are compared to the standard hours expected. The result at the machine hourly cost represents the productive rate variance.

The above variances are accumulated in machine storage to be reported on departmental cost statement at the month-end.

DAILY FINISHED PRODUCTION REPORT

Each day a clerk in the finishing department will type a report of orders completed in the department, along with weights, grade code and operation code. As this report is being prepared, a punched paper tape is produced simultaneously which, in turn, is converted to punched cards in the data processing department. The cards are used to establish the finished goods inventory, but the purpose for which they are mentioned here is that they are used to compare the quantities charged out of the finishing department with quantities charged in (accumulated in machine storage as a result of preparing run reports).

MONTH-END CLOSING

One of the drawbacks of a punched card accounting system is that charges to accounts are accumulated throughout the accounting period in card form, summarized by machine when all charges are through and posted to the proper accounts. This results in account balances being stale until the closing has taken place. The above accounts for one of the advantages of a large capacity random access storage machine. All charges to accounts are passed through the machine on a daily basis to produce basic reports such as an accounts payable voucher register, daily invoice register or stores activity list, and are adjusted simultaneously to proper general ledger accounts, control or otherwise. When and if subsidiary ledgers are run subsequently, they are verified to the control account held in the machine.

Let us assume at this point that:

1. Stores activity for the month is complete
2. Accounts payable have been closed
3. All sales invoices for the month have been completed
4. Cash received reported
5. Labor charges finalized

THE GENERAL PAPER COMPANY LIMITED
MONTHLY OPERATING STATEMENT

MILL	DEPT.	DEPT. CODE	DATE	PAGE NO.	
DATA		STANDARD		ACTUAL	
		MONTH	YR. TO DATE	MONTH	YR. TO DATE

6. All run reports for the month prepared and, of course, the affected general ledger accounts in machine storage have been posted.

Journal vouchers for internal transfers from department to department are prepared to set up accruals, value work in process, etc., to finalize account adjustment in order to prepare statements. When such journal vouchers have been keypunched and the resulting cards properly balanced, they will pass through the computer to adjust the proper accounts. These cards will then be filed for use in preparing a detailed general ledger when desired.

STATEMENTS PREPARED

1. Cost statements by departments

The cards (referred to as distribution cards) for stores, accounts payable, journal vouchers, labor distribution, which have been discussed up to this point are grouped according to general ledger control account code. Cost statements are prepared from such distribution cards coded to the control cost account. By including balance forward cards from the previous month (*Exhibit 6*) and sorting all cards in the proper sequence, cost statements are prepared, *Exhibit 11*. The total actual expense as recorded on these statements will, of course, balance with the control account in the general ledger. (The allowances are computed since unit costs have been stored in the machine and statistics have been built up in the machine storage as a result of preparing run reports.)

Distribution cards coded to control for selling and administration are processed in a similar manner to produce a more simplified statement.

2. Profit and Loss statement and balance sheet

The coding structure has been designed to allow the machine system to print a profit and loss statement or balance sheet. The normal practice, of course, is to extract from the machine storage a trial balance of all ledger accounts for scrutiny and adjustment. Since the adjustments to accounts for purposes of drawing off financial statements follow a similar pattern each month, it is possible to program this computer to make such adjustments, print financial statements and re-adjust

the necessary accounts in preparation for the next accounting period. As postings to general ledger accounts contained in machine storage are made daily, it is possible to prepare financial reports of various kinds immediately if such is desired by management. There are, of course, various methods used to produce copies of statements, the most common being carbon copies if a limited number is required. This company prints all statements on continuous form offset masters and as many copies as desired are produced by an offset press.

CONCLUSION

It was stated in the introduction that emphasis would be placed on the method of operating the accounting system and not on the original makeup of the system itself. The processing of the basic data, the information needed to carry out the accounting system, is too often given little or no attention in papers written on accounting, while in most companies the cost of merely processing these basic data is of major concern.

Part of the foregoing mechanical procedure is in practice today, part of it has been changed and improved, and the remainder is theoretical. The writer is convinced that it could be put into operation in its entirety, but it would have to be in an organization that could utilize a machine system to capacity or near capacity.

The use of computers in cost accounting is still in the development stage, but already there is sufficient evidence to indicate that such equipment will fill an important role in this area. The cost accountant considers himself a provider of tools for management through his forecasts and the analyses of results he obtains. Through the use of computers, more and better information will be available to management for control purposes. Since it will also be more up-to-date, more use will be made of it, and so management will be based increasingly upon knowledge rather than upon hunch.

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LOOKING AHEAD

World-wide mail delivery by electronic mail box is the latest forecast for the future. An American telephone company executive predicts that "electronic mail boxes will permit the letter sender to deposit his letter, drop a coin in the box, dial the designation like a telephone call, and have his letter transmitted by satellites to a selected ground station." (*N.Y. Jrn. of Commerce*)

More effective and economical display of Canadian products abroad will be possible through a new organization formed to exhibit Canadian merchandise cooperatively at European trade fairs. Expected to become operative by the spring of 1962, "Intermart" will offer the exhibitor a package deal consisting of transportation, display and promotion of his wares at all the major fairs which will cost much less than would an individual exhibit. Besides purchasing space en bloc and looking after all arrangements, the organization will provide a staff of multi-lingual sales representatives to accompany and promote the products. (*Ind.-Comm. News Service*)

Attachments for seat belts will be standard equipment in the front seats of all 1962 cars. At about \$12-14 per pair, safety belts are cheap insurance against injury or death. With the use of safety belts, the National Safety Council in the U.S. estimates, the fatality rate would drop at least 20% and injuries would drop 50% (*Bus. Week*, Mar. 4, 11, 1961)

The five big scientific breakthroughs expected in the '60s, according to a *News Front* magazine survey of research heads of major U.S. corporations, are:

- *Manned space flight*—probably before the end of 1961
- *Fusion power*—this reaction occurs at an estimated temperature of 100 million degrees Fahrenheit. No known material can contain it but the best hope is "sealing" it from matter through some electrical and/or magnetic means
- *Thermoelectricity*—the direct conversion of heat to electricity. Thermoelectric devices have already been used in satellites' radios and recording instruments, but the problem is to produce it at a cost competitive with existing energy production
- *Cancer cure or control*—both drugs and vaccines offer hopeful avenues
- *Synthesis of life*—Progress has been made in synthesizing complex protein molecules, the building blocks of living matter. Synthesis of actual viruses which are midway between the living and non-living, might come before 1970. (*Management Rev.*, Mar., 1961)

OF GENERAL INTEREST

An estimated 4,211,400 Canadians receive cheques from the federal government each month—family allowances, 2,500,000; universal old age pensions, 900,000;

civil servants and employees of Crown Corporations, 340,000; veterans and dependants, 189,000; aged, disabled and blind pensioners, 157,000; members of the armed forces, 120,000; RCMP, 5,400. (*Quick Canadian Facts*)

The distribution of capital investment in the post-war period in the United States and Russia compares like this:

	U.S.A.	U.S.S.R.
Industry	25%	50%
Agriculture	10%	16%
Transportation	10%	10%
Housing	25%	15%
Other	30%	9%

(*"Annals"*—*American Academy of Political and Social Science*)

The average light bulb is built to last for about 750 - 1,000 hours.

Business failures in Canada increased 21% in 1960, up from a total of 2,229 in 1959 to 2,699. The average liability per failure jumped from \$42,973 last year to \$54,929 this year. In the trade sector, failures rose from 672 to 919; in manufacturing, from 374 to 546; in construction from 449 to 604; in transportation, from 76 to 107; in services, from 307 to 322. (*DBS, Mar. 17, 1961*)

The performance of women in industry as measured by several British studies showed that single women claimed more sickness benefits than men and that married women claimed more than unmarried women. Young married women had a worse record of absenteeism through illness than young single women but the record of older women, whether married or single, approximately equalled that of the men of their own age. Though most firms retire women earlier than men, the evidence of sickness rates suggests there is little medical or psychological reason to support an earlier retirement age for women. (*The Manager, Feb. 1961*)

Collectively, hospitals are big business. The 7,000 hospitals in the U.S. will spend about \$10 billion this year and will employ 50% more people than the car makers and oil refiners combined. (*Dun's Rev., Mar. 1961*)

ON THE PERSONAL SIDE

Ski fans may find shorter "boards" an aid in developing confidence and natural ability. Now on the market are 2½-ft. and 5-ft. skis recommended for practice for those who find the longer skis a handicap. (*Bus. Week, Feb. 4, 1961*)

If the human body continued to grow at the same rate of speed it does in the first pre-natal month, by the age of 20 it would be measured in billions of miles rather than in inches. (*Precis*)

The goals of men at different ages are a good thing to keep in mind when dealing with people. A leading personnel director points out that a man wants different rewards as he gets older: in the early 20's, it's self-esteem; in the late 20's, the chance to learn; in the early 30's, he wants greater responsibility; from 30 to 45, it's recognition; from 45 to 55, status and prestige; and after 55, new challenges. (*Management Guide, Jan. 1961*)

All-aluminum structural frames for houses, assembled with ordinary tools, will soon be available in Canada. Suitable for luxury homes, the industry thinks it will be a while before they are cheap enough for small homes. (*Fin. Post, Feb. 18, 1961*)

The Editor's Choice

INTERNATIONAL MANAGEMENT

Advanced Management, Jan. 1961.

This whole issue is devoted to a commentary on management in Latin America, India, Africa, Russia, Germany, and in America. Conditions differ widely in these countries and the influence of American methods has had varied results. The common theme that seems to run through all these articles is the great need that is present for men of integrity and knowledge to take up the task of leadership in promoting new ideas and efficient methods for all countries.

"DIRECT" COSTING FOR EXTERNAL REPORTING

By C. Thorngren and G. H. Sorter, The Accounting Review, Jan. 1961.

In this short article, the authors present a strong case for the use of variable costing in external reporting. They contend that variable costing is reasonable and consistent with "generally accepted accounting principles", and that it will provide those who use external reports with more helpful information. They recognize shortcomings of the technique in certain situations.

PAYBACK AS AN AID IN CAPITAL BUDGETING

By H. E. Dougall, The Controller, Feb. 1961.

In this article, the author defends the use of the payback method when it is used for the right purpose. He explains some of the misuses and misconceptions about the method, and concludes that it is a useful and necessary tool and, under conditions of uncertainty, may be the only test of feasibility.

EVALUATION OF CAPITAL PROJECTS—AN APPLICATION OF THE INVESTOR'S METHOD

By C. B. Allen, N.A.A. Bulletin, Jan. 1961.

This is a simplified version of the discounted cash flow or investor's method of calculating return and evaluating the worth of investment in various projects. There are some useful forms on profit evaluation and cash rate of return evaluation.

PREPARING THE ANNUAL REPORT

By E. R. Floyd, AMA Research Study 46.

There is much useful material in this study. The preface states, "Although still in the experimental stage, annual reports have tended to show some definite patterns. It is the purpose of this AMA study to identify these patterns for executives charged with planning and preparing annual reports in their companies." The first part of the study sets forth the prevailing practices used by 278 companies surveyed in producing the reports. The second part makes an analysis of various reports on the basis of their organization and the space allotted to the items in their content.

S.I.C.A. News



ANNUAL MID-YEAR MEETING

One of the most interesting proposals to come out of the annual mid-year meetings of the Board of Directors in February was that of the Committee on Publicity and Public Relations to make a study of the public relations image created by the Society in the business community.

Over the next two years the Committee intends to review and analyze each of the facets of Society activity that make up the collective image. This study will include all services and promotional literature. The Committee then hopes to make recommendations that will strengthen the public relations picture over the long-term development of the Society.

As part of the public relations program, the Committee also recommended that the Society publish an annual report to be sent to all members prior to the annual meeting each year. Both of these proposals were approved by the Board of Directors and the Committee has already held one meeting in March to launch their proposed plan of action.

Long-range planning in another field was provided for by the Board's appointment of a three-man committee of past presidents to study facility and staff requirements over the next ten years. The committee expects to have its plans well developed before the expiry of the national office lease.

The highlight of the Board of Directors' luncheon on Friday, February 17, was the presentation of a citation to Professor D. R. Patton who last year retired as Chairman of the Co-ordinating Education Committee after 13 years in office. The presentation followed a report by Professor Patton on his Colombo Plan mission to Pakistan last year. His successful mission to Pakistan is but one of the many contributions Professor Patton has made to the progress of the Society since he became associated with it in the early 1930's. In brief, they are commemorated in the words of the citation which read:

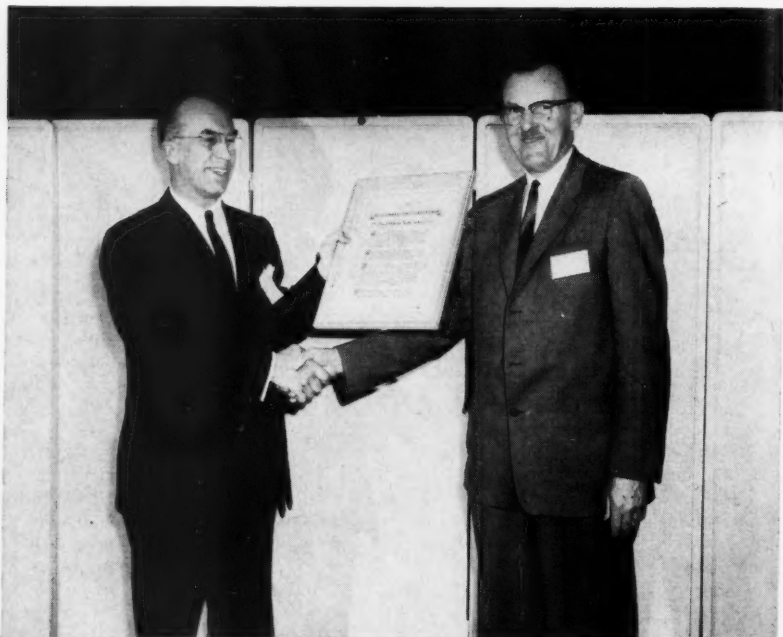
"Donald Rand Patton, practitioner and teacher of accounting, guiding spirit and motivating force of many endeavours for the advancement of the accounting profession as a whole and for the Society of Industrial and Cost Accountants in particular, a grateful membership acknowledges its indebtedness to you for your unflinching service over the years.

"Your accomplishments, which are a monument of your ability, energy, versatility and selfless devotion have won the respect of accounting practitioners and are a source of pride and inspiration to every member of the Society.

"As Past President of the Society of Industrial and Cost Accountants of Canada and the Society of Industrial and Cost Accountants of Quebec, as Chairman of our

Co-ordinating Educational Committee over a period of thirteen years, as spokesman for the Society in International Affairs and as Representative of Canada in Colombo Plan Administration in Pakistan, your unselfish and dedicated efforts have contributed to the enrichment of the accounting profession.

"I hold every man a debtor to his profession", said Francis Bacon. Rarely can it be said, as we say to you, that the profession is debtor to the man."



DONALD R. PATTON, at right, recently retired from the Chairmanship of the Co-ordinating Educational Committee of the Society after 13 years in office, is presented with a citation by National President George H. Greenhough. The presentation took place at the annual mid-year meetings of the Board in February.

PERSONALS

ROGER LALIBERTE, C.A., has been admitted into partnership in the firm of Angers, Martel & Co., Chartered Accountants, Quebec City.

E. W. AUMAND, M.B.E., has been appointed Assistant Secretary of the Quebec Hydro-Electric Commission. Mr. Aumand is a General Member of the Montreal Chapter.

D. F. ATKINSON, R.I.A., has been transferred to the Montreal office of Trans Canada Airlines from Winnipeg. Mr. Atkinson was winner of the 1960 Gold Medal in Advanced Cost Accounting.

G. J. VAN BUSKIRK, C.G.A., R.I.A., formerly General Manager and Comptroller of Standard Coil Products (Canada) Limited, Toronto, has been appointed Vice-President of his Company.

N. R. BARFOOT, R.I.A., formerly Secretary of Fiberglas Canada Limited, Toronto, has been promoted to Vice-President, Administration and Secretary. For many years, Mr. Barfoot wrote the "Topical Comments" section of *Cost and Management*, then known as "C. & M. Round-Up."



CHAPTERS AND MEMBERSHIP

Manitoba Convocation

The annual Convocation of the Society of Industrial and Cost Accountants of Manitoba was held at the University of Manitoba on January 27th. W. J. Condo, Vice-President and Comptroller of the University, presented R.I.A. certificates to the 22 graduates. Awards were presented by G. L. F. Riddell, R.I.A., Past President of the Manitoba Council, to the following students: H. L. Rachlis—highest average in Accounting I and Industrial Legislation; D. R. Scott—highest average in Accounting II and Industrial Organization; M. J. Loades—Silver Medal for the highest average in Accounting III, Managerial Statistics, and Fundamentals of Cost; D. F. Atkinson and G. E. Heyser—co-winners of the Gold Medal for the highest mark in Advanced Cost Accounting; R. A. McLeod—Book prize for the highest aggregate in Accounting I, II and III.

Daniel Sprague, C.A., R.I.A., President of James B. Carter, Ltd., gave the convocation address. Mr. Sprague told the graduates that three factors would figure in their future success—continuing study, experience, and active association with the professional body. A top management position should be their eventual goal. Mr. Sprague urged, as he pointed out the lack of qualified personnel to fill key management positions in business. Over 25% of the R.I.A.'s in Canada hold the rank of controller, secretary-treasurer, vice-president or president, he said, and "the quality



ADDRESSING THE GRADUATES at the recent convocation ceremonies of the S.I.C.A. of Manitoba was Daniel Sprague, C.A., R.I.A., President of James B. Carter Ltd. In the background from left, are: W. J. Condo, Vice President and Comptroller of the University of Manitoba; G. L. F. Riddell, R.I.A., Past President of the Manitoba Council; W. L. Moore, R.I.A., President of the Manitoba Society; and the Reverend D. D. Stewart.

of their performance in business is having the most favorable influence on the reputation and prestige of the Society."

W. L. Moore, R.I.A., President of the S.I.C.A. of Manitoba, introduced the speaker and the Reverend D. D. Stewart invoked the blessing.

Inter-Chapter Competition

The chapter standings at February 28, 1961 indicate that the Oshawa District Chapter is still holding on to its first place position with 2,708 points and the Winnipeg Chapter its second place with 2,324 points. The Saint John Chapter with 2,108 points has taken over third place from the Moncton Chapter, which is now down to fifth position.

Manuscripts sent in for possible publication in **Cost and Management** constitute one major source of points on the competition; new general members are another. One other adjustment of standings will take place when membership maintenance is computed. The formula for this is based upon two membership ratios—maintenance and continuity. One reflects the total year's growth in membership (adjusted for members transferring in and out of chapters), while the latter takes into account member resignations and suspensions.

The National President's Trophy for First place includes an attractive lectern that becomes the permanent possession of the winning chapter. The chairman of the chapter will also receive a return trip ticket to the 40th Annual Cost and Management Conference in Vancouver to receive the award. Second and third place winners will receive handsome leather folders, suitably inscribed, for use at chapter meetings by their chairmen.



CONFERENCES AND SEMINARS

Spring Seminars Oversubscribed

The Alberta Society hosted its first S.I.C.A. seminar on "Managerial Controls" early last month. The location was the Banff School of Fine Arts and the moderators were Professor Bennett of the University of Texas, and Gerald G. Fisch, Executive Vice President of Payne-Ross Limited. The group attending was unanimous in its praise of the three-day presentation and expressed enthusiasm about further seminars in Alberta.

Also during March a goodly registration was realized for a seminar in Quebec City on "Reporting Financial Data to Management." The moderators were Dr. Alphonse Riverin, Economic Adviser to the Government of the Province of Quebec, and Alan B. Dixon of the Hydro-Electric Power Commission of Ontario.

Indications are that the last two seminars scheduled for the current season, "Direct Costing" on April 12 to 14 at the Guild Inn, Toronto, and "Organization and Administration of the Accounting Function" at the Seigniory Club on May 3 to 5, will be oversubscribed. The "Direct Costing" seminar was filled a month before the presentation date, while applications for attendance at the latter program promised to reach full capacity long before the scheduled date. Where it has not been possible to accommodate all applications for a specific seminar, consideration will be given to repeating the presentation next year.

Conference Plans Shaping Up

Preparations for the 40th Cost and Management Conference moved into high gear during March and it is expected that full details of the program will be released some time this month. Keen interest is being shown in the arrangements for group

excursion travel from the East. When the questionnaires which were mailed with the first conference announcement have been tabulated, firm plans and arrangements will be announced.

1962 World Congress of Accountants to be Held in New York

The Eighth International Congress of Accountants will be held at the Waldorf-Astoria Hotel, New York City, on September 22 through 27, 1962.

Members who are interested in attending may communicate directly with the Congress headquarters at 270 Madison Avenue, New York 16, N.Y., and they will be kept informed as arrangements for the Congress are developed.

It would be most helpful if those planning to attend would notify the National Office, so that we will have some indication of the representation from our Society.



PUBLICATIONS AND TECHNICAL SERVICES

Reading is the Key . . . to Better Business

Between April 16th and 22nd libraries across Canada are again celebrating Canadian Library Week with the slogan "Reading is the Key." The aim of the week is to call attention to library services or lack of them. Dominion statistics show that in 1958 some four million Canadians were without this service, that only six centres were up to the Library Association's minimum standards, that Canada as a whole spent about ten cents per capita on library books, that Canada spent about half as much as the U.S. and Britain on public libraries and circulated its books only one-half to one-third as frequently. This is not a good record for a country such as Canada.

Books are one of the main keys to education, personal development and national strength. It is good business to support adequate library facilities but it is just as important for us to use and promote the usage of all available libraries, both public and those owned by professional institutions such as colleges and associations.



STUDENTS AND COURSES

ACCOUNTING II.

QUESTION 6 (15 marks)

The management of a business merchandising small wares is desirous of establishing an efficient inventory control system in order to accomplish the following purposes. Each purpose is to be considered separately.

- (a) The business has branches which perform the selling function for the Head Office. Management is desirous of having a system established which will enable them to detect losses from pilferage or other causes.
- (b) Management requires a monthly profit and loss statement and finds that due to the wide range of stock handled it is difficult to take physical inventory each month.
- (c) Management, realizing the costs of carrying excessive inventories and also realizing the disadvantages of not having the stock when it is required, desires a system whereby this problem might be kept to a minimum.

REQUIRED:

In each of the above cases outline the advice which you would give to management using illustrations where possible and setting out the entries where you consider it advisable to do so.

SOLUTION 6.

(a) The inventory control system which would be provided in the branch situation outlined would reflect the losses from pilferage or other causes. The primary point in question here is to determine the manner in which the perpetual inventory control system might be developed. The customary control system applied under this particular set of circumstances is that the branches are billed for all shipments from head office at retail, and the account which is charged is correspondingly credited for all sales represented by the branch. This particular system is adaptable to circumstances where the major management functions and price determinations are carried out by head office. The retail basis of the perpetual inventory system is considered to be simpler mechanically than the use of cost. In any event, the corresponding physical inventory must be taken and prices set at retail before the information in regard to losses from pilferage or other causes can be determined.

(b) Where it is difficult to take physical inventory and it is necessary to prepare operating statements, then the system which would be applied would be one which would provide perpetual inventory recording, either by actual recording or by estimation. In the case of the estimated procedure which is normally applied to this set of circumstances, it is necessary to project the purchases to a retail basis which will indicate through the adjustment for sales on a retail basis the closing inventory at retail. For statement purposes, of course, this must be reduced to cost, and it is done by reducing the retail value by the mark-up percentage previously utilized in respect to purchases.

(c) This is primarily a problem of maintaining the necessary inventory on hand in order to meet the demands of the customers and at the same time not carrying excess of stock over and above that required to have the goods on hand in the amount required, at the place required and at the time required. The system which has been designed to facilitate this type of inventory control is one which sets down maximum and minimum quantities for the individual line. In order to be effective it is necessary that perpetual inventory record of quantities be maintained and checked periodically as the balances against the maximum and minimum control points which have been set.

COMMENT—QUESTION 6

The major areas of deficiency in the answers submitted were

1. A failure on the part of the student to elaborate his answer in order that the marker could be assured that the student was aware of the meaning of the terms which were being used.

A perpetual inventory system at cost provides the item of cost of sales. This is not determined from the closing inventory.

2. A failure on the part of the student to assess properly the conditions set out in the question. This might have arisen from a failure to read the question carefully or an inability on the part of the student to realize the significance of the facts given.

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